NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY
OF
DRILLING OPERATIONS

U. S. NAVY

W. T. FORAN NO. 1

HUSKY OIL NPR OPERATIONS, INC.
Prepared by: S. L. Hewitt
Edited by: R. G. Brockway

For the

U. S. GEOLOGICAL SURVEY
Office of the National Petroleum Reserve in Alaska
Department of the Interior
JUNE 1983

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W. T. FORAN NO. 1

INTRODUCTION

The U. S. Navy-W. T. Foran No. 1 well is located in the National Petroleum Reserve in Alaska, formerly the Naval Petroleum Reserve No. 4 (Figure 1). The well is 671 feet from the north line and 564 feet from the west line of protracted Section 13, Township 17 North, Range 2 West, Umiat Meridian (Latitude: 70°49'56.01" North; Longitude: 152°18'11.23" West). Alaska State Plane Coordinates are X = 704,057 and Y = 6,156,945, Zone 5. Elevations are: Kelly Bushing 39'; Pad 13', and Ground 8'. Drilling related operations started with rig-up on February 13, 1977, and terminated on April 30, 1977.

The well was drilled to a total depth of 8,864 feet. The primary objectives of the well were the Sadlerochit and Lisburne Groups, with secondary interests in the Kuparuk Sandstone. At the conclusion of drilling and evaluation operations, the well was abandoned with cement and mechanical plugs set at selected intervals.

Husky Oil NPR Operations, Inc. supervised and directed the drilling and support operations as prime contractor for the Navy. Nabors Alaska Drilling, Inc. was the drilling contractor and Nabors Rig 25, a National 110, was used to drill the well.

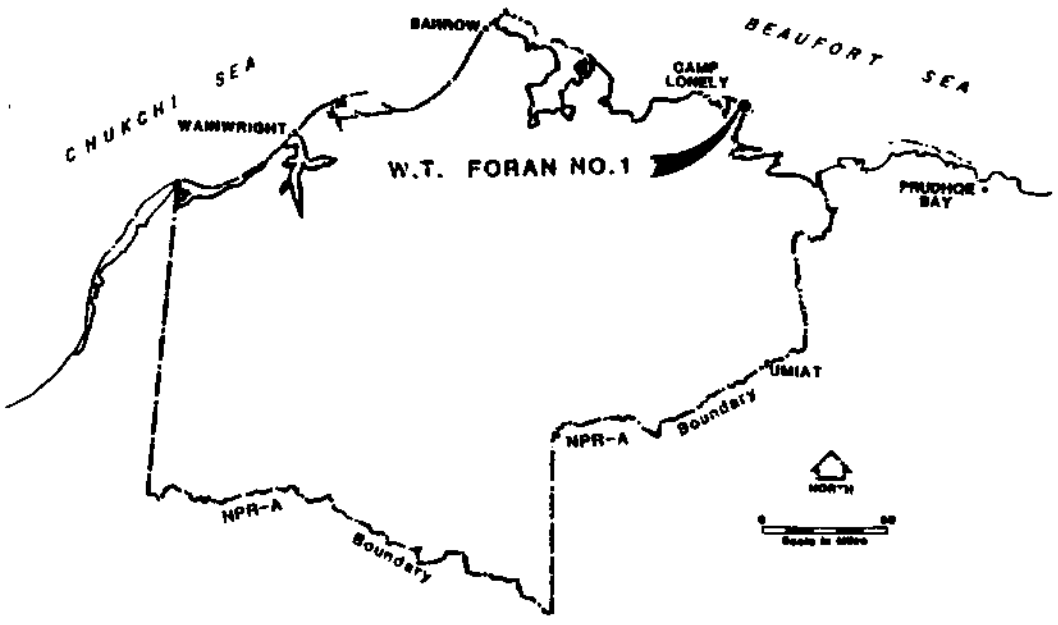


FIGURE 1 - WELL LOCATION MAP - W. T. FORAN NO. 1

DRILLING SUMMARY

Field operations at the W. T. Foran No. 1 location started on November 23, 1976, with the mobilization of construction crews and equipment required to build the drilling pad and ice airstrip to accommodate C-130 Hercules aircraft. Construction work was completed on December 20, 1976, and the crews and equipment moved to another location.

Rig move-in operations began on January 30, 1977. The rig, Nabors 25, had been stacked at Nabors' yard at Deadhorse. The rig move was made using Hercules aircraft and was completed in 20 days with a total of 110 loads, including cement and other miscellaneous equipment. Rig-up operations began on February 13, 1977. Rig-up was completed in 22 days and the well spudded March 6, 1977, at 12:00 midnight. Weather conditions during rig move and rig-up were generally good, but intermittent winds of 25 to 35 knots with blowing snow did hamper flying conditions on three occasions.

During rig-up, a 20" conductor had been set at 102' and cemented with ArcticSet II cement. An 18-1/2" hole was drilled out below the 20" conductor to 2440'. Minor problems with clays plugging the flow line were corrected with the addition of phosphate to the mud system. The hole was logged from 2440' (logger's total depth) to the bottom of the conductor with the DIL/SP and BHC-Sonic/GR log. The logging tools reached bottom on the second attempt. The BHC-Sonic/GR log did not record the intervals 2440' to 2350' or 1700' to 400'. After logging, the 16" casing was run; but after three joints were run, problems with damaged couplings were encountered. After inspecting the casing and conditioning the hole, the casing was run to 1454' where it stuck. Circulation was established, but the pipe would not move. A four-barrel pill of free-pipe was spotted around the shoe. Four-barrel increments were pumped six times while working the pipe but with no success. The 16" casing was then cemented to surface with 1,605 sacks of ArcticSet cement.

A 16", 5,000 psi blowout-preventer stack (SRRA arrangement) was installed on the 16" casing head. A 5,000 psi choke manifold and kill line were also installed. The 16" casing was tested to 2,000 psi and drilled out with a 13-1/2" bit to 3544'. The drilling rate had to be reduced due to the excessive clays being drilled. Drilling continued to 6634'. Lost approximately 150 barrels of mud at estimated depth of 6380'. Drilling then continued to 6805' where another 40 barrels were lost. Lost-circulation material was added to the mud and drilling continued to 7539'. Core No. 1 was cut from 7539' to 7557' with full recovery. Drilling was resumed to 7591', the 10-3/4" casing point. The 13-1/2" hole was logged from 7568' to the 16" casing shoe with the DIL, BHC-Sonic/GR Log, FDC/CNL/CAL/GR, and the HDT-Dipmeter. Twenty sidewall cores were attempted and 18 were recovered. Intermediate 10-3/4" casing was run and landed at 7587'. Two FO cementers were run in the string and landed at 1339' and 1295' for use if Arctic Pack procedures became necessary. The 10-3/4" casing was cemented with 1,000 sacks of Class "G" cement containing turbulence inducer and retarder. Approximately 75 barrels of mud were lost while mixing and displacing the cement.

Blowout-preventer equipment was tested and the casing tested to 3,000 psi. The 10-3/4" casing was drilled out with an 8-1/2" bit and the formation tested to a 0.61 psi/ft. gradient. An 8-1/2" hole was drilled from 7587' to 7676'. Drill-Stem Test No. 1 was run over the interval 7587' to 7676' with the packer set in the 10-3/4" casing. A total of 125 barrels of formation water, containing a very slight amount of dissolved gas, was recovered. Drilling was resumed to 8253'. Drill-Stem Test No. 2 was run over the interval 8205' to 8253'. Drill-Stem Test No. 2 was a misrun. Core No. 2 was cut from 8253' to 8283' with full recovery. Drill-Stem Test No. 3 was run over the interval 8206' to 8283', recovering 11.2 barrels of slightly oil-cut formation water. Drilling was resumed to 8864' total depth. The 8-1/2" hole was logged with the DIL, BHC-Sonic/GR, FDC/CNL/CAL/GR, and the HDT-Dipmeter. A Velocity Survey was also recorded. Twelve sidewall cores were attempted and ten recovered.

All logs were recorded on magnetic tape and computer log interpretations were prepared using Schlumberger's Synergetic Log Systems. A single-shot deviation survey was run while drilling. The 18-1/2" hole remained "straight," with a maximum deviation of 1° at 536' and decreasing to 1/4° at 2440'. After drilling out the 16" casing and while drilling new 13-1/2" hole, the deviation increased to 4-1/4° at 3000' and to 8° at 3544'. The deviation gradually decreased to 1-1/2° at 4581' but increased to 7° at 7537' and 7591'. After running 10-3/4" casing and drilling out in 8-1/2" hole, the deviation decreased to 1-1/2° at 8594' but increased to 8° by total depth at 8864'.

At the conclusion of the log evaluation, a decision was made to plug and abandon the hole. Cement plugs were placed across selected intervals in the 8-1/2" hole as follows: Plug No. 1 from 8280' to 8080' with 70 sacks Class "G", Plug No. 2 from 7724' to 7574' with 65 sacks Class "G". A Variable Density/Cement Bond log was run in order to determine the cement quality behind the 10-3/4" casing across zones of interest to be tested. A retainer was set at 7565' in the 10-3/4" casing.

The 10-3/4" casing was perforated over the interval 7512' to 7520' at four shots per foot. Drill-Stem Test No. 4 was run over this interval with the packer set at 7437'. The test recovered 131 barrels of formation salt water containing a very slight trace of oil. A retainer was set at 7470' and the perforations were squeezed with 65 sacks Class "G" cement. Ten sacks were spotted on top of the retainer.

The 10-3/4" casing was cut at 950'. Lost circulation around the stub was encountered, requiring 80 barrels of lost-circulation material mud to stabilize the hole. A 70-sack plug of Class "G" cement was spotted at 940'. The mud was reversed out to water and then to diesel. The well began to flow back diesel. Another plug consisting of 208 sacks of Class "G" with 2% calcium chloride added was placed from 942' to 842' in the 16" casing. A surface plug was placed in the 16" casing and the abandonment marker installed. The rig was released April 24, 1977, at 6:00 p.m. The rig was rigged down and stacked on location for the summer.

Detailed drilling information, in the form of bit records, mud summary, time analysis, and casing and cementing reports, is included in the body of the report.

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL ☒ DEEPEN ☐ PLUG BACK ☐

b. TYPE OF WELL: OIL WELL ☒ GAS WELL ☐ OTHER — SINGLE ZONE ☐ MULTIPLE ZONE ☐

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface
x = 704,057. y = 6,156,945. Sec 13, T17N, R2W
At proposed prod. zone
Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 82 miles East of Barrow

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 4200'

16. NO. OF ACRES IN LEASE: 23,680,000

17. NO. OF ACRES ASSIGNED TO THIS WELL: N/A

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.: 122,800'

19. PROPOSED DEPTH: 8820'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): ± 8' GL (est), 25' KB (est).

22. APPROX. DATE WORK WILL START*: January 15, 1977

5. LEASE DESIGNATION AND SERIAL NO.: N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: Naval Petroleum Reserve #4

9. WELL NO.: W. T. Foran #1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 13, T17N, R2W

12. COUNTY OR PARISH: No. Slope Borough

13. STATE: Alaska

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
26"	20	133 (k-55)	80	To surface w/Permafrost
18½"	16	84 (ss-95)	2500	To surface w/Permafrost
13½"	10 3/4"	60.7 (ss-95)	7000	250 sks Class "G"
8½"	7"	32 (N-80)	Liner	340 sks to cover entire liner length w/Class "G"

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum and Oil Shale Reserves, Serial #394, 27 August 1968.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

SIGNED _____ TITLE Drilling Manager DATE _____

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ APPROVAL DATE _____

Accepted for the record: (Orig. Sgd.) SIDNEY A. SMITH OIL AND GAS SUPERVISOR DATE OCT 29 1976

Form 10 – 401
REV 1-1-71

SUBMIT IN TRIPLICATE
(Other instructions on reverse side)

STATE OF ALASKA

OIL AND GAS CONSERVATION COMMITTEE

PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER — SINGLE ZONE [ ] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL
At surface: x = 704,057. y = 6,156,945. Sec 13, T17N, R2W.
At proposed prod. zone: Same

5. N/A

6. LEASE DESIGNATION AND SERIAL NO: N/A

7. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

8. UNIT FARM OR LEASE NAME: Naval Petroleum Reserve #4

9. WELL NO: W. T. Foran #1

10. FIELD AND POOL OR WILDCAT: Wildcat

11. SEC. T. R. M. (BOTTOM HOLE OBJECTIVE): Sec 13, T17N, R2W

12. No. Slope Borough

13. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 82 miles East of Barrow

14. BOND INFORMATION
TYPE N/A Surety and/or No. Amount

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT (Also to nearest drlg. unit, if any): 4200'

16. NO. OF ACRES IN LEASE: 23,680,000

17. NO. ACRES ASSIGNED TO THIS WELL: N/A

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL DRILLING COMPLETED OR APPLIED FOR, FT: 122,800'

19. PROPOSED DEPTH: 8820'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, CR, etc.): ± 8' GL (est), 25' KB (est).

22. APPROX. DATE WORK WILL START*: January 15, 1977

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	GRADE	SETTING DEPTH	QUANTITY OF CEMENT
26"	20"	133	k-55	80	To surface w/Permafrost
18½"	16"	84	k-55	2500	To surface w/Permafrost
13½"	10 3/4"	60.7	n-110	7000	250 sks Class "G"
8½"	7"	32	N-80	Liner	340 sks to cover entire liner length w/Class "G"

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum and Oil Shale Reserves, Serial #394, 27 August 1968.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program.

24. I hereby certify that the Foregoing is True and Correct

SIGNED _____ DATE _____ TITLE Drilling Manager

(This space for State office use)

CONDITIONS OF APPROVAL, IF ANY

SAMPLES AND CORE CHIPS REQUIRED	MUD LOG	OTHER REQUIREMENTS
[ ] YES [ ] NO	[ ] YES [ ] NO	
DIRECTIONAL SURVEY REQUIRED: [ ] YES [ ] NO	A.P.I. NUMERICAL CODE	

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Form 9-330
(Rev. 5-63)

REVISED June 27, 1983

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ DRY ☒ Other

7. UNIT AGREEMENT NAME: N/A

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other Abandonment

8. FARM OR LEASE NAME: Naval Petroleum Reserve No. 4

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

9. WELL NO.: W. T. Foran No. 1

3. ADDRESS OF OPERATOR: 3201 C Street, Anchorage, AK 99503

10. FIELD AND POOL, OR WILDCAT: Wildcat

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface x = 704,057; y = 6,156,945
At top prod. interval reported below
At total depth

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 13, T17N, R2W

14. PERMIT NO.: N/A — DATE ISSUED:

12. COUNTY OR PARISH: North Slope — 13. STATE: Alaska

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
3/7/77	4/14/77	Abandoned 4/24/77	GL 8'; Pad 13'; KB 39'	8' (est)

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
8864' MD	Surface	N/A	→	0-8864'	None

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: N/A

25. WAS DIRECTIONAL SURVEY MADE: No

26. TYPE ELECTRIC AND OTHER LOGS RUN: DIL, BHC-Sonic/GR, GDC/CNL/GR, HRD, CDL/VDL/GR, Velocity Survey

27. WAS WELL CORED: Yes

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	133#	102'	26"	612 sx Arctic Set II	None
16"	84#	1454'	18 1/2"	1605 sx Arctic Set II	None
10 3/4"	60.7#	7587'	13 1/2"	1000 sx Class "G"	950'

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

31. PERFORATION RECORD (*Interval, size and number*)
7512-20'
HyperJet II @ 4JSPF

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7512-20'	Retainer, 70 sx Class "G"

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
N/A	N/A	P and A

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*) — TEST WITNESSED BY

35. LIST OF ATTACHMENTS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED _____ TITLE Drilling Manager DATE _____

*(See Instructions and Spaces for Additional Data on Reverse Side)

REVISED June 27, 1983

SUBMIT IN DUPLICATE*

STATE OF ALASKA

OIL AND GAS CONSERVATION COMMITTEE

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. API NUMERICAL CODE: 50-103-20010

6. LEASE DESIGNATION AND SERIAL NO: N/A

7. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

8. UNIT, FARM OR LEASE NAME: NavalPetroleumReserveNo.4

9. WELL NO: W. T. Foran No. 1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., (BOTTOM HOLE OBJECTIVE): Sec 13, T17N, R2W

12. PERMIT NO: N/A

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ DRY ☒ Other

1b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other Abandonment

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*

At surface: x = 704,057; y = 6,156,945

At top prod. interval reported below

At total depth

13. DATE SPUDDED	14. DATE T.D. REACHED	15. DATE COMP. SUSP. OR ABAND.	16. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	17. ELEV. CASINGHEAD
3/7/77	4/14/77	Abandoned 4/24/77	GL 8'; Pad 13'; KB 39'	8' (est)

18. TOTAL DEPTH, MD & TVD	19. PLUG, BACK MD & TVD	20. IF MULTIPLE COMPL., HOW MANY*	21. ROTARY TOOLS	INTERVALS DRILLED BY	CABLE TOOLS
8864' MD	Surface	N/A	0-8864'		None

22. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: N/A

23. WAS DIRECTIONAL SURVEY MADE: No

24. TYPE ELECTRIC AND OTHER LOGS RUN: DIL, BHC-Sonic/GR, FDC/CNL/GR, HRD, CBL/VDL/GR, Velocity Survey

25. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB/FT.	GRADE	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	133#	K-55	102'	26"	612 sx Arctic Set II	None
16"	84#	K-55	1454'	18 1/2"	1605 sx Arctic Set II	None
10 3/4"	60.7#	P-110	7587'	13 1/2"	1000 sx Class "G"	950'

26. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

27. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

28. PERFORATIONS OPEN TO PRODUCTION (Interval, size and number): N/A

29. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7512-20' @ 4JSPF	Retainer, 70 sx Class "G"

30. PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
N/A	N/A	P and A

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
			→				

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
		→				

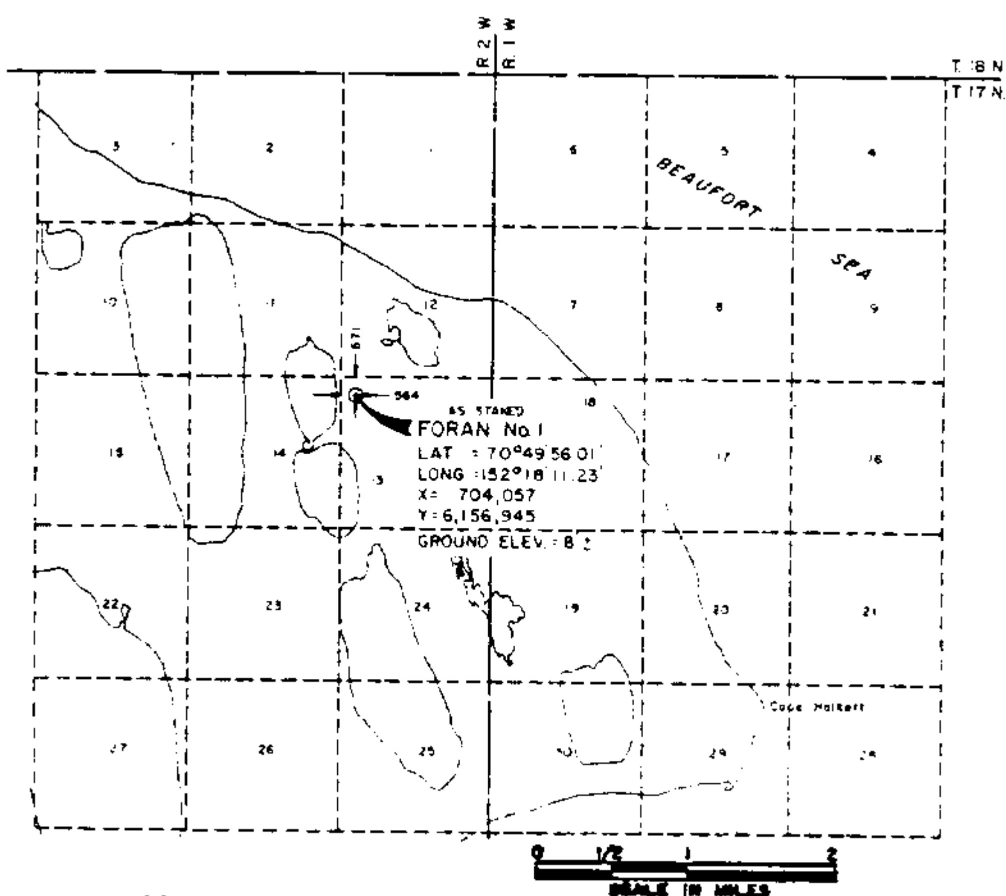
31. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)

32. LIST OF ATTACHMENTS

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

SIGNED _____ TITLE Drilling Manager DATE _____

*(See Instructions and Spaces for Additional Data on Reverse Side)



CERTIFICATE OF SURVEYOR

I hereby certify that I am properly registered and licensed to practice land surveying in the State of Alaska and that this plat represents a location survey made by me or under my supervision, and that all dimensions and other details are correct.

7-22-76 — Date

[signature] — SURVEYOR

STATE OF ALASKA — Andrew F. Potts — NO. 2145

FORAN No. 1

Located in

Surveyed for

HUSKY OIL

N.P.R. OPERATIONS INC.

Surveyed by

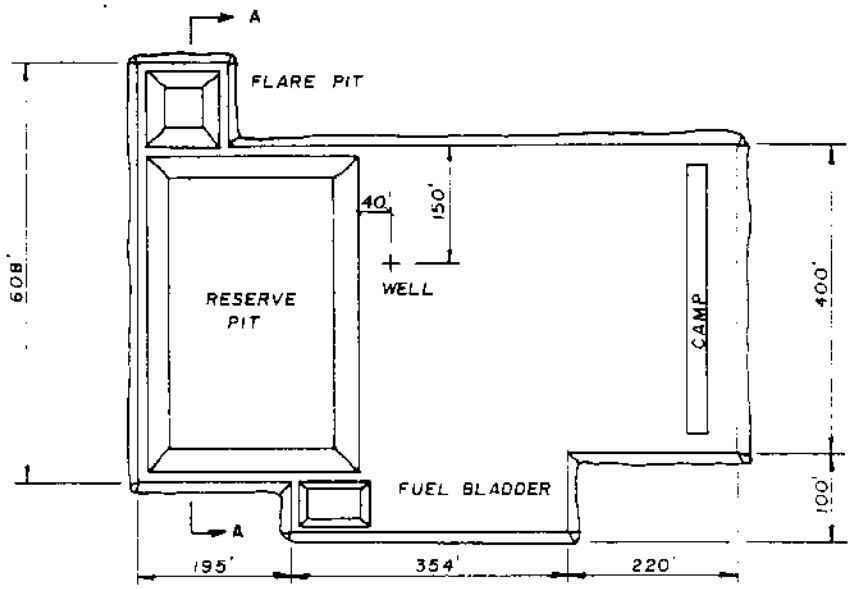
F.M. LINDSEY & ASSOC.

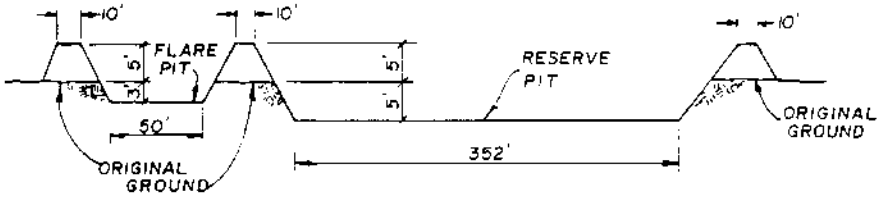
LAND & HYDROGRAPHIC SURVEYORS

2502 West Northern Lights Boulevard Box 4-0

Anchorage

W. T. FORAN DRILLSITE





SECTION A-A

DRILL PAD DRAWING

OPERATIONS HISTORY

DATE AND FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
2/1/77	Began moving in. Received seven Herc loads. Cleared camp and airstrip in preparation for moving rig in.
2/2/77	Began rig move. Have received a total of nine Herc loads.
2/3/77	Continued with rig move. Have received a total of 16 Herc loads.
2/4/77	Continued with rig move. Began rigging up camp.
2/5/77	Set four camp units; began installing sewer plant. Set fuel tank and light plant. Have received a total of 29 loads.
2/6/77	Set 10 camp units; installed sewer plant. Began moving mud. Have received a total of 42 Herc loads.
2/7/77	Received four more Herc loads. Most of camp has been set up. Installed camp radio; cleaned camp units.
2/8/77	Continued setting up camp. Have received 56 Herc loads to date.
2/9/77	Installed pit liners and bladder tank. Installed axle on tanker trailer. Rolligons worked on airstrip and location road. Continued with camp installation. Have received a total of 62 Herc loads.
2/10/77	Have received 75 Herc loads. Continued rigging up camp. Hauled and set matting boards; received kitchen unit and Dowell unit; built docks and received crane.
2/11/77	Continued rigging up camp; concentrated on kitchen unit. Set matting boards. Have received a total of 84 Herc loads.
2/12/77	Have received 95 Herc loads. Insulated hallways. Kitchen is operational. Laid matting boards; set subbase and pin. Received Geoservices unit from

Fairbanks. The 966 loader now operational. Mukluk radios in. Need north strobe, ceiling light, and five runway lights.

2/13/77 Began rigging up rig. Have received 103 Herc loads. Repaired strobe and runway lights and pin sub. Rigged up motor sheds; set mud pumps; installed one mud end. Cleaned snow out of sub and buildings; unloaded Hercs. Road grader is on location.

2/14/77 Have received 106 loads. Set walkways and steps; set in rotary beams, table, and bushings; set elevator and repaired; set three engines and draw works; cleaned out snow; worked on road and airstrip.

2/15/77 Have received 107 Herc loads. Set in water tank, generators, mud pump, one mud pit, and accumulator. Set houses on pits. Hooked up diesel tanks and installed pit liner. Received blowout-preventer unit; cleaned airstrip; cleaned out reserve pit.

2/16/77 One rig generator is running. Installed heat ducts, desilter, and mud agitators. Installed houses on four mud tanks; put derrick together. Set boiler feed tank and auxiliary water tank.

2/17/77 Have received 109 Herc loads. Set mud mixing tank and mud hoppers. Completed work on derrick. Started hot-air heater; installed fuel supply line and rig wiring. Hooked up miscellaneous lines. Received two welding machines and drilling tools.

2/18/77 Set derrick on floor; strung derrick lights and blocks; set shaker; worked on pump suctions. Received miscellaneous wellhead equipment.

2/19/77 Leveled mud tanks; installed centrifugal pump; hooked up compound; bolted down draw works; welded on steps. Hooked up fuel lines to No. 2 motor. Received Catco shop building. Sent Alaska General grader to South Simpson; sent elevator, sewer pipe, and windwalls to South Simpson.

2/20/77 Welded and hooked up mud systems, ladders, and walkways. Raised derrick and installed floor. Installed light brackets and wired up power and lights.

2/21/77 Completed windwalls; tied in rig electrical lines; worked on mud systems and boilers; set up Dowell cement unit and tanks.

2/22/77	Worked on mud system and winterization. Cleaned up location. Ready to receive cement.
2/23/77	Worked on steam lines and mud system. Set winterization and performed general rig-up. Worked on snow removal. No aircraft in due to weather.
2/24/77	Worked on steam and water lines, mud system shaker shoe, desander, and desilter. Set in manifold building. Received three loads of cement. Cleaned airstrip. Received grader.
2/25/77	Worked on mud system, steam heaters, and boiler lines. Performed general rig-up. Worked on snow removal.
2/26/77	Welded and worked on steam heaters; worked on boilers and piping to steam heaters; fired one boiler. Continued miscellaneous rig-up. Hauled cement and fuel. Worked on snow removal.
2/27/77	Worked on boiler. Worked on mud system and steam heaters. Continued general rig-up. Both boilers are now working. Set up snow melter.
2/28/77	Started rig engines. Worked on mud system; set Hydril under subbase; worked on slide and catwalk. Performed general rig-up. Tested snow melter; it tested OK.
3/1/77	Rigged up miscellaneous lines; set shed on beaver slide; continued general rig-up. Moved mud and cleaned location. Received Kodiak water tank.
3/2/77	Rigged up miscellaneous electrical system. Detected bad bearing in compound housing; pulled and returned to Anchorage. Set 20" casing and cemented with 312 sacks ArcticSet II cement. Received Hough 65 and Kodiak water tank.
3/3/77	Hooked up mixing pumps and feed pumps. Set beaver slide and catwalk. Continued miscellaneous rig-up. Topped off 20" with 300 sacks ArcticSet II. Stockpiled snow.
3/4/77	Hooked up miscellaneous lines; worked on mud system; repaired runway lights. Stockpiled snow.
3/5/77	Welded on 20" head. Picked up kelly, set pipe racks, mixed spud mud. Stockpiled snow for melter.

3/6/77	Picked up drill collars. Worked on Pump No. 1; assembled blow-down line and accumulator. Cleaned up location and filled mud pits. Tested 20" weld to 700 pounds. Spudded well at 12:00 midnight, March 6, 1977.
3/7/77 256'	Total Depth: 256'; Mud Weight: 8.8; Viscosity: 80. Drilled out cement; drilling ahead.
3/8/77 745'	TD: 1001'; MW: 10.4; Vis: 45. Drilling. Plugged flow line. Added phosphate to system. Tripped at 991' for Bit No. 2. No fill.
3/9/77 1276'	TD: 2277'; MW: 9.8; Vis: 60. Drilled ahead.
3/10/77 163'	TD: 2440'; MW: 10.0; Vis: 84. Tripped in to condition hole for casing. Drilled to 2440'. Circulated 1/2 hour and made short (10-stand) trip. Circulated 1-1/2 hour. Dropped survey and steel-line measured out. Rigged up Schlumberger tools. Tools stopped at 1360'. Tripped in with bit, collars, and 18-1/2" stabilizer. Circulated two hours. Raised viscosity and tripped out. Ran Schlumberger DIL from 2440' to surface. BHC-Sonic did not record from 2440' to 2350' or 1700' to 400'. Tripped in to condition for casing.
3/11/77 0'	TD: 2440'; MW: 10; Vis: 81. Prepared to run 16" casing. Ran shoe joint and two joints of casing. Replaced collar from bad joint. Checked remaining casing and found 10 bad collars. Laid down casing and shoe. Tripped in and conditioned hole. Chained out and rigged up to run 16" casing.
3/12/77 0'	TD: 2440'; MW: 10.1; Vis: 71. Prepared to work stuck casing. Ran 36 joints of 16", 84#, K-55, 8rd casing at 1454' K.B. Pipe would not go. Attempted to pick up; no movement. Broke circulation and could not get pipe movement. Ran stab-in tool on drill pipe but could not break circulation. Pulled out of collar; regained circulation. Pulled out of hole and inspected stab-in tool. Circulated through casing OK. Tripped in with stab-in tool. Broke circulation OK. Spotted four barrels of free-pipe around shoe. Pulled out of hole. Worked pipe. Pulled up to 255,000 pounds. No movement.
3/13/77 0'	TD: 2440'; MW: 9.8; Vis: 60. Pumped four-barrel increments six times, waiting 15 minutes each time for a soak period. Worked pipe each time to

	225,000 pounds. Pipe would not move. Ran stab-in tool in drill pipe. Stung in and circulated. Cemented with 1,605 sacks ArcticSet II at 15.2 ppg, with 14.7 ppg returns (53 barrels). Cement in place at 3:45 p.m. Displaced with 55 barrels water and 19 barrels mud. Circulated out excess and pulled out of hole. Raised Hydril and set slips with 100,000 pounds. Cut off 16" casing. Nippled down and nippled up blowout-preventer equipment. Waited on cement.
3/14/77 0'	TD: 2440'; MW: 9.4; Vis: 52. Nippled up blowout preventer on 16" casing, choke lines, and Cameron choke. Cleaned shale pits. Hooked up poor-boy degasser. Pressure tested choke manifold to 5,000 psi. Tested OK. Filled with diesel. Tested blowout-preventer stack to 2,000 psi. Tested OK. Tested casing to 2,000 psi.
3/15/77 0'	TD: 2440'; MW: 8.7; Vis: 38. Built mud volume. Prepared to drill out. Finished nippling up; laid down 9" collars; picked up bottom-hole assembly. Tagged cement at 1372'; drilled float collar and cement to 1454'. Drilled out shoe. Drilled out stringers below shoe. Dumped cement-contaminated mud. Built volume.
3/16/77 884'	TD: 3324'; MW: 9.6; Vis: 52. Drilled ahead. Slowed drilling rate due to clay over the shaker. Treated mud for clay. Released one Rolligon water hauler and operator; released one D-8 dozer and operator. One hundred joints of 10-3/4" casing on location.
3/17/77 341'	TD: 3665'; MW: 9.9; Vis: 63. Drilled to 3544'. Tripped out for new bit. Picked up monel.
3/18/77 334'	TD: 3989'; MW: 9.9; Vis: 58. Drilled ahead to 3948'. Pulled out of hole. Picked up stabilizers. Reamed and conditioned hole. Drilled ahead.
3/19/77 419'	TD: 4408'; MW: 9.7; Vis: 43. Drilled ahead.
3/20/77 266'	TD: 4674'; MW: 9.8; Vis: 43. Drilled ahead to 4674'. Tripped out for bit. Inspected kelly cock and upper and lower saver subs. Prepared to drill ahead.
3/21/77 340'	TD: 5014'; MW: 9.7; Vis: 44. Drilled ahead.

3/22/77 394'	TD: 5408'; MW: 10; Vis: 44. Drilled ahead to 5314'. Tripped. Drilled ahead.
3/23/77 462'	TD: 5870'; MW: 9.9; Vis: 42. Drilled ahead.
3/24/77 361'	TD: 6231'; MW: 9.9; Vis: 40. Steel-line measured out of hole. Made 14-foot correction from 5897' to 5883'. Drilled ahead.
3/25/77 403'	TD: 6634'; MW: 10.0; Vis: 41. Tripped in. Drilled to 6634'. Tripped for Bit No. 9.
3/26/77 351'	TD: 6985'; MW: 10.0; Vis: 45. Lost 150 barrels of mud at 6380'. Lost 40 barrels mud at 6805'. Slowed pump; returns OK. Loaded system with fine mica and fine nut plug. Brought pumps up OK.
3/27/77 250'	TD: 7235'; MW: 10.1; Vis: 43. Tripped at 7227' for bit. No fill on trip.
3/28/77 333'	TD: 7568'; MW: 10.2; Vis: 45. Tripped. Drilled ahead to 7568'. Tripped out.
3/29/77 2'	TD: 7539'; MW: 10.2; Vis: 45. Tripped out (steel-line measured) and corrected 31' from 7568' to 7537'. Tested blowout preventer to 3,000 psi. Tested OK. Tripped in with junk sub; drilled two feet and cleaned out. Tripped out and picked up core barrel. Tripped in.
3/30/77 52'	TD: 7591'; MW: 10.2; Vis: 45. Tripped out to log. Cut Core No. 1 from 7539' to 7558'; 100% recovery. Drilled to 7591'. Conditioned hole for logs. Pulled out of hole.
3/31/77 0'	TD: 7591'; MW: 10.2; Vis: 45. Rigged up Schlumberger. Ran DIL, 7568' to 1458'; BHC-Sonic 7547' to 1458'; FDC/CNL/GR, 7566' to 1570'; HDT, 7566' to 2400'. Shot 20 sidewall cores; recovered 18. Rigged down Schlumberger.
4/1/77 0'	TD: 7591'; MW: 10.2; Vis: 43. Tripped in and conditioned hole to run casing. Tripped out and rigged up to run 10-3/4" casing. Changed ram blocks to 10-3/4". Ran 10-3/4" casing (100 joints in as of 6:00 a.m.).
4/2/77 0'	TD: 7591'; MW: 10.3; Vis: 45. Picked up blowout preventer and prepared to set slips. Ran 178 joints of 10-3/4", 60.7#, P-110, 8rd casing with shoe at 7587' KB and FS at 7545' KB. Ran a total of 14

	centralizers. Circulated and cemented with 1,000 sacks Class "G" with 0.75% D-65 + 0.2% D-13R. Pumped 50 barrels water ahead of bottom plug. Displaced top plug with 682 barrels. Did not bump plug. Checked floats. OK. Lost 75 barrels of mud during cement job. Cement in place at 3:45 a.m. Picked up blowout preventer and prepared to set slips.
4/3/77 0'	TD: 7591'; MW: 10.3; Vis: 45. Tripped in. Picked up bottom-hole assembly. Raised blowout preventer and set slips. Nippled up and tested well head to 3,000 psi. OK. Changed rams. Laid down 8" drill collar and picked up 6" drill collar. Tested casing and blowout preventers to 3,000 psi. OK. Tripped in. Corrected depth of float collar from that reported on 4/2/77 (7497'). Lower FO at 1339' and upper FO at 1295'.
4/4/77 10'	TD: 7601'; MW: 10.1; Vis: 55. Tagged cement at 7473'. Firm cement to float and shoe. Drilled 2' of new formation; dumped cement-contaminated mud; built volume and weight. Drilled to 7601'. Tested to 645 pounds surface pressure. Pulled out of hole.
4/5/77 75'	TD: 7676'; MW: 10; Vis: 45. Tested blowout preventer and choke line to 5,000 psi. OK. Drilled ahead to 7676'. Circulated and conditioned hole. Pulled out of hole and picked up test tools. Ran in hole with Drill-Stem Test No. 1.
4/6/77 0'	TD: 7676'; MW: 9.8; Vis: 40. Ran Drill-Stem Test No. 1: 7587' to 7676'. Recovered 125 barrels formation water at ±12,000 ppm chlorides. Ran in hole with bit.
4/7/77 375'	TD: 8051'; MW: 9.8; Vis: 45. Drilled ahead.
4/8/77 202'	TD: 8253'; MW: 10.1; Vis: 40. Pulled out of hole for Drill-Stem Test No. 2. Drilled ahead.
4/9/77 0'	TD: 8253'; MW: 10; Vis: 40. Ran in hole with bit. Ran Drill-Stem Test No. 2: 8205' to 8253'. Set lower packer at 8202'. Ran 3000' water cushion. Drill-Stem Test No. 2 was misrun. Ran in hole to condition for Core No. 2.
4/10/77 30'	TD: 8283'; MW: 10.0; Vis: 41. Recovered one button insert in junk basket on conditioning trip.

4/11/77 0'	TD: 8283'; MW: 10.1; Vis: 50. Pulled out of hole with Core No. 2. Cut 30' core; 100% recovery. Ran in hole to condition for Drill-Stem Test No. 3. Ran Drill-Stem Test No. 3. Set packers at 8206'. Test interval: 8206' to 8283'. Ran 3000' water cushion. Opened tool with slight blow increase to medium. Shut in for initial shut-in. Opened for final flow. Medium flow for two hours; shut in for final shut-in. No gas. No fluid to surface.
4/12/77 103'	TD: 8386'; MW: 10.1; Vis: 45. Reversed out drill-stem test recovery. Pulled packer loose. Tripped out and laid down drill-stem test tool. Repaired mud valve. Tripped in with bit. Drilled ahead.
4/13/77 230'	TD: 8616'; MW: 10.1; Vis: 42. Drilled ahead.
4/14/77 149'	TD: 8765'; MW: 10.1; Vis: 42. Made 10-stand short trip at 8628'. No drag; no fill.
4/15/77 79'	TD: 8844'; MW: 10.2; Vis: 41. Drilled to 8779'. Dropped survey. Tripped for bit. Tripped in. Reamed 100' to bottom (precautionary). Drilled ahead.
4/16/77 20'	TD: 8864'; MW: 10.2; Vis: 43. Drilled ahead to 8854'. Circulated samples. Drilled to 8864'. Circulated and conditioned for logs. Tripped out and rigged up Schlumberger. Ran DIL, FDC/CNL; currently running BHC-Sonic.
4/17/77 0'	TD: 8864'; MW: 10.1; Vis: 44. Ran BHC-Sonic. Ran High-Resolution Dipmeter. Tool stopped at 8662'. Tripped in with bit. No bridge; 6' of fill. Circulated and conditioned. Tripped out and ran High-Resolution Dipmeter.
4/18/77 0'	TD: 8864'; MW: 10.1; Vis: 44. Ran Velocity Survey. Ran sidewall core. Tripped in and conditioned hole. Tripped out and laid down drill collars.
4/19/77 0'	TD: 8864' (PBTD 7574'); MW: 10.1; Vis: 43. Tripped in open ended to 8280' (49' below Lisburne). Spotted 70-sack plug of Class "G" cement with 3 barrels of water ahead and behind. Pulled out dry to 7724' (100' below Sadlerochit). Spotted 65-sack plug of Class "G" cement. Pulled out dry to 7575'. Reversed out excess (5 sacks). Pulled out of hole. Tripped in with casing scraper, three drill collars, jars, and drill pipe. Cleaned out to 7574' and

	circulated. Pulled out of hole. Rigged up Schlumberger. Ran VDL-CBL. Having electrical problems in logging unit.
4/20/77 0'	PBTD: 7565'; MW: 10.1; Vis: 42. Schlumberger found short in CBL tool. Resumed logging with VDL-CBL/GR. Cement top at 6160'. Good bond above and below test interval. Retimed retainer-setting tool. Ran Hornet II retainer on drill pipe and set at 7565'. Pulled out of hole and rigged up to perforate. Perforated 7512' to 7520' at 4 shots per foot. Picked up drill-stem test tool and ran in hole. Set packer at 7437'. Rigged up floor manifold.
4/21/77 0'	PBTD: 7470'; MW: 10.1; Vis: 42. Opened drill-stem test tool at 6:09 a.m. Good to strong blow throughout. Salt water to surface after 132 minutes (IFP 15 minutes, FFP 120 minutes). Shut in and built up for four hours. Reversed out. Pulled packer loose at 2:15 p.m. Tripped out. Ran retainer set at 7470'. Squeezed with 75 sacks Class "G", 2-3/4 BPM and 1,500 psi FSDP, 600 psi. Pulled out of hole three stands and cleared drill pipe. Tripped out laying down.
4/22/77 0'	PBTD: 7470'; MW: 10.1; Vis: 41. Pulled 10-3/4" casing. Laid down drill pipe. Picked up blowout preventer and changed drilling spools. Tripped in with Tri-State cutters; cutter broke. On second trip, cutter slips would not seat. On third trip, cut at 950'. Pulled casing. Power tong clutch failed. Broke connections with rig tongs and roped out.
4/23/77	PBTD: 950'. Laid down 10-3/4" casing. Tripped in open-ended to 950'. Hole taking fluid. Mixed and pumped 40-barrel pill of lost-circulation material. Still taking fluid. Mixed and pumped second 40-barrel pill. Hole stabilized. Spotted 70-sack plug at 940'. Waited on cement. Displaced mud to water to diesel. Laid down drill pipe. Diesel began to flow back then held steady 15' below bell nipple. Began rig-down operations.
4/24/77	Rigged up elevators and tripped in open-ended to 942'. Circulated out diesel with mud. Spotted 208 sacks Class "G" with 2% $CaCl_2$. Laid down drill pipe. Spotted surface cement plug and wellhead marker after removing blowout preventer.
4/25/77	Released rig at 6:00 p.m., 4/24/77. Set out wind walls. Cleaned mud tanks. Drained all miscellaneous fuel tanks. Laid down derrick. Chained up trucks.

4/26/77	Set out suction and premix mud tanks, fuel tanks, and hot-air heater ducts. Set elevator; set out dog house and A-frame. Took derrick from floor and unstrung blocks and crown. Unhooked motors, draw works, and compound.
4/27/77	Continued rigging down and stacking on location.
4/28/77	Rig-down complete. Preparing to demobilize some support equipment (grader, truck, and loader).
4/29/77	Completed stacking rig. Demobilizing rig support equipment.
4/30/77	Support equipment demobilized to Deadhorse.

DRILLING TIME ANALYSIS

W. T. FORAN NO. 1

NABORS ALASKA DRILLING, INC., RIG 25

Spudded 3/6/77, Rig released 4/24/77

Total Depth: 8,864 Feet

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 1 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1977 1-30																							12		Loading Out Rig
1-31																							12		Loading Out Rig
2-1																							15		Loading Out Rig
2-2																							12		Setting Up Camp
2-3																							14		Setting Up Camp
2-4																							13		Setting Up Camp
2-5																							13		Setting Up Camp
2-6																							13		Setting Up Camp
2-7																							18		Setting Up Camp
2-8																							24		Setting Up Camp
2-9																							12		Setting Up Camp
2-10																							24		Setting Up Camp
2-11																							24		Setting Up Camp
2-12																							24		Setting Up Camp
2-13	24																							Rigging Up	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 2 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
2-14	24																							Rigging Up	
2-15	24																							Rigging Up	
2-16	24																							Rigging Up	
2-17	24																							Rigging Up	
2-18	24																							Rigging Up	
2-19	24																							Rigging Up	
2-20	24																							Rigging Up	
2-21	24																							Rigging Up	
2-22	24																							Rigging Up	
2-23	24																							Rigging Up	
2-24	24																							Rigging Up	
2-25	24																							Rigging Up	
2-26	24																							Rigging Up	
2-27	24																							Rigging Up	
2-28	24																							Rigging Up	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN No. 1 Page 3 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
3-1	24																							Rigging Up	
3-2	24																							Rigging Up	
3-3	24																							Rigging Up	
3-4	24																							Rigging Up	
3-5	24																							Rigging Up	
3-6	12	½						10															1½	Rigging Up	Spudded Well at 12:00 Midnight
3-7		18½			½			1½															3½	Drilling	
3-8		15¾		3½	1¼			3½																Drilling	
3-9		9¾		6	¼			5½	2½															Drilling	
3-10				6¾				2¼	6	9														Trip	
3-11				3				2		7¾													11¼	Rig Up To Run Casing	W.O. Stuck Casing
3-12										13½													10½	Conditioning Hole	W.O. Stuck Casing
3-13												24												Nippling Up	
3-14				6				2				8	1½										6½	Nipple Up B.O.P.	
3-15		13½			½	¼		9½															¼	Conditioning Mud	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 4 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
3-16		9¼		5	4¾			3															2	Drilling	
3-17		14½		3½	3¾	¼		2																Drilling	
3-18		13¼	1¾	4	5																			Drilling	
3-19		18½		2	1¾			1¾																Drilling	
3-20		13½		3¼	2½	¼	½																4	Trip	
3-21		19		3¼	1¾																			Drilling	
3-22		22		1¼		¾																		Drilling	
3-23		14¼		5½	½	¼	1																2½	Drilling	
3-24		21¼				¼																	2½	Drilling	S.L.M. 14' Correction
3-25		15¾	½	6	½	1¼																		Trip	Lost Circulation
3-26		19		2½	½			2																Drilling	
3-27		17¼	½	4¾				1¼																Drilling	
3-28		¾	1	8½	½			5¼					7½										½	P.O.H.	31' S.L.M. Corrections
3-29		1½	2	10¼				¼									6½						3	Coring	Core No. 1
3-30		2		2½	½			2½	16½															P.O.H.	Ran Schlumberger Wireline Logs

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 5 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
3-31				5	¼		½	4½	6¼	1¾		5¾												Logging	Ran 10¾" Casing
4-1										24														Running Casing	
4-2										4½		19½												Nippling Up	
4-3		¼		3				12½										½					7¾	Trip In	
4-4		5		4				11					2¼										1¾	P.O.H.	
4-5																		20¾					3¼	R.I.H. With Tester	D.S.T. No. 1
4-6		11	1½	5½				2½										2¼					1¼	Trip In	
4-7		18½			2			3½																Drilling	
4-8				6				3										12					3	Trip Out	D.S.T. No. 2
4-9			1½	13		1		2									1						5½	Changing B.H.A.	Core No. 2
4-10			1	11				3¾									4½						3¾	Coring	D.S.T. No. 3
4-11		4¼		8½			½											10					¾	Testing	
4-12		24																						Drilling	
4-13		21½		1½		¼		1																Drilling	
4-14		14	½	5¾	1¼	½		2																Drilling	

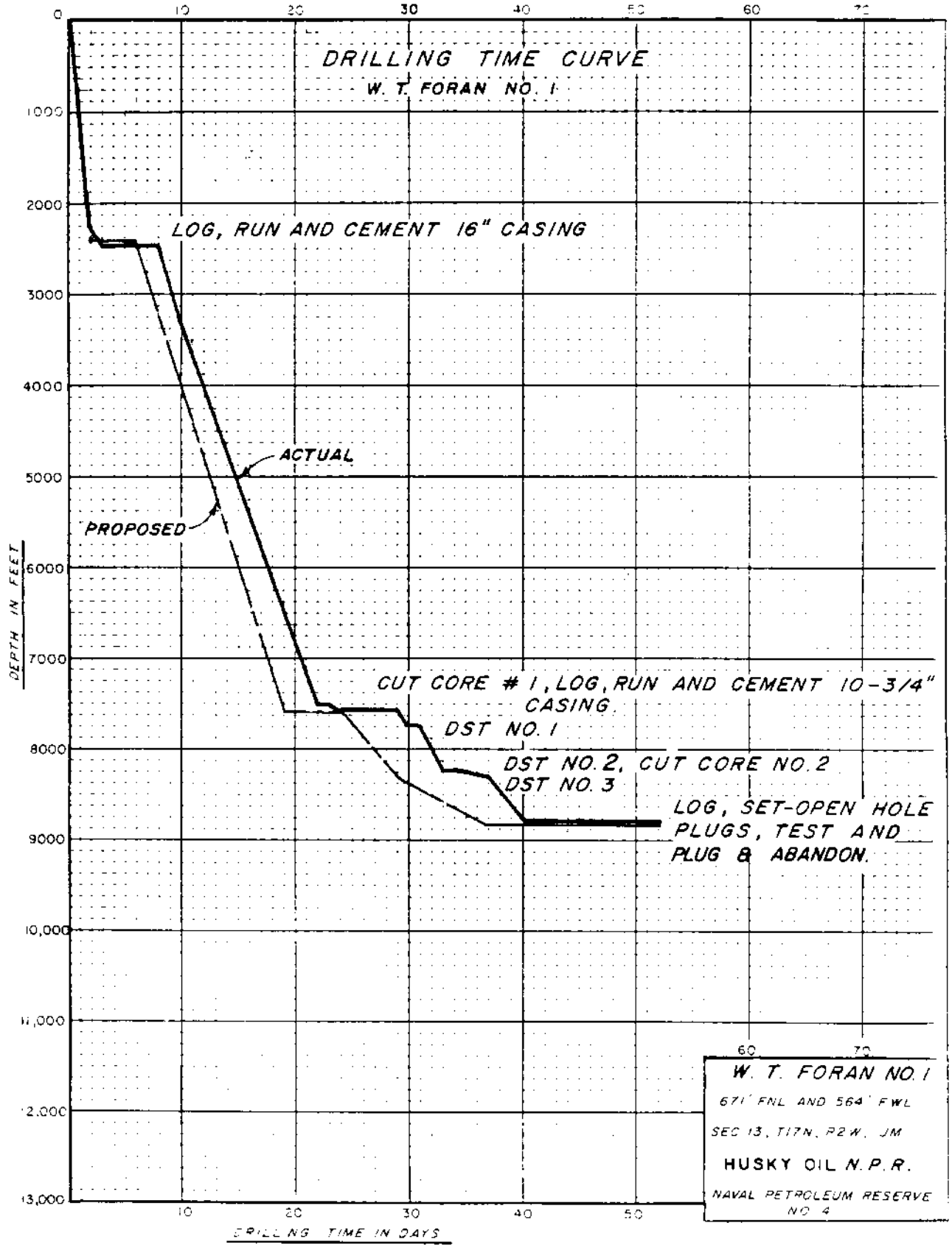
DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 6 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
4-15		10		2½	½			6	5															Drilling	
4-16				5				2½	16½															Logging	Ran Schlumberger Wireline Logs
4-17				2¾	11½			1	8¾															Logging	
4-18				9		¼		4¼	1½										6				3	Trip In	Laid Down Drill Collar
4-19				7½					15½									1						Logging	
4-20						¼												20¾	½				2	Testing	D.S.T. No. 4
4-21																			10½	1½			12	Laying Down Drill Pipe	
4-22								6½			3¼								4¼				10	Laying Down Casing	
4-23	14¾							6											3¼					Hooking Up B.O.P.	Nippling Down
4-24	24																							Rigging Down	Rig Released at 6:00 p. m.
4-25	24																							Rigging Down	
4-26	24																							Rigging Down	
4-27																							24	Stacking Out Rig	
4-28																							24	Stacking Out Rig	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. W. T. FORAN NO. 1 Page 7 of 7

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
602½		10¼		40¼		2½		78½		3¼			11¼		-0-		12		24½	-0-		368¼		
TOTALS HOURS	368		177½		6		126½		60¼		57¼		-0-		-0-		67¼		1½		-0-			

27


DRILLING TIME CURVE
W. T. FORAN NO. 1
LOG, RUN AND CEMENT 16" CASING
ACTUAL
PROPOSED
CUT CORE # 1, LOG, RUN AND CEMENT 10-3/4" CASING.
DST NO. 1
DST NO. 2, CUT CORE NO. 2
DST NO. 3
LOG, SET-OPEN HOLE PLUGS, TEST AND PLUG & ABANDON.
DEPTH IN FEET
DRILLING TIME IN DAYS
W. T. FORAN NO. 1
671' FNL AND 564' FWL
SEC 13, T17N, R2W, UM
HUSKY OIL N.P.R.
NAVAL PETROLEUM RESERVE NO. 4

WELL HISTORY

Magcobar

DRILLING MUD RECORD

Operator	Husky Oil
Well	W.T. Foran #1
Contractor	Nabors
Engineers	Faulkner/Stevens/Shields/Drollinger
Field	Pet 4
County/Parish	North Slope
State	Alaska
Mud type	Benex (spud) Lignosulfonate
Spud date	3-6-77
Date TD	4-8-77
Casing – Surface	Size 16, Depth 1454
Casing – Intermediate	Size 10-3/4, Depth 7587

Date	Meas. Depth	TVD	Mud Wt	Vis Sec	Angle and Direction	Flow Rate (gpm)	Flow Line Temp	PV	YP	Gels 0/10	pH	API Fluid Loss	HT-HP Fluid Loss	Pf	Mf	Pm	Salt or Chloride	Calcium ppm	Sol %	Oil %	Sand
3-7	200		8.9	80			56	12	12	4/20	8.5	16					650	100	4		
Drilled out cement in conductor pipe - spud mud mixed drilled ahead																					
3-8	1000		9.6	52				9	10	3/15	9.0	17		.4	1.0		800	160	8		2
Drilling ahead wireline broke POOH to recover survey tool drilling ahead																					
3-9	2100		9.9	60		661		10	10	4/21	9.0	16		.4	1.0	1.1	650	160	10		2
Drilling ahead. Reached TD at 2440 circulated POOH schulmberger tool stopped at 1340 TIH clean out raise vis POOH to log																					
3-10	2440		10	84		561	60	20	23	7/23	9	7.8		.15	.8		2000	200	11		1
Circulating hole ready to run casing POOH for casing run																					
3-11	2440		10	81		437		19	19	5/15	9	7.6		.1	.8		2000	200	11		1
Circulating hole (too many problems with casing so stood back casing) POOH again for casing run																					
3-12	2440		10.1	71			58	24	22	8/26	9	6.4		.1	.7		2050	200	12		1.5
Run casing and stuck at 1454. Mixed Mag-ophos pill still no results Waiting on orders																					
3-13	2440		9.8	60			58	19	18	4/18	9	6.9					2000	200	12		1.5
Fixing D-Sander and D-Silter dump and re mix mud to continue drilling																					
3-14	2440		9.4	55			48	19	17	7/15	9	7.4					1900	200	10		1
Condition mud																					
3-15	2440		8.7	38																	
Build new mud system prior to drilling ahead																					
3-16	3260		9.6	52		449	58	22	22	9/45	9.5	7.6		.05		1.5	950	100	8		.5
Drill ahead POOH for bit TIH to drill ahead																					
3-17	3658		9.9			411	71	23	18	15/78	9.5	7.7		.9	1.15	1.5	1000	100	6		.5
Drilled ahead started using spersene to break back gels																					
3-18	3940		9.9			445	78	28	14	6/34	9.5	7.2		.55	1.1	.8	1050	80	9		
Drilled ahead POOH for bit																					
3-19	4287		9.7	63		444	74	15	14	4/20	10.5	6		.9	1.15	1.5	1000	100	9		
Drilled ahead POOH for bit																					
3-20			9.8	63		605	72	18	16	5/20	9.5	6		.65	1.85	1	900		13		
Drilling ahead ran survey and made wiper trip 10 stands back on bottom drill ahead																					
3-21	4970		9.7	64		641	84	11	13	3/5	9	6		.4	1.7	.5	600	200	9		
Drilling ahead																					
3-22	5312		10	64		654	97	15	16	5/10	10.5	4.8		1	2.7	1.15	700	160	10		
Drilling ahead																					
3-23	5824		9.9	62		640	90	12	13	2/5	10.5	5.8		.9	2.5	.85	700	120	9		
Drilling ahead																					
3-24	6180		9.9	60		622	94	11	4	2/4	10	6		.7	2.1	.4	700	120	10		
Drilling ahead																					
3-25	6510		10	61		622	96	16	8	4/6	9.5	5.2		.5	1.7	.5	550	80	10		
Drilling ahead lost volume down hole																					
3-26	6845		10	65		645	99	19	14	3/5	10	5.8		.8	1.5	.8	450	40	13		
Drilling ahead lost 200 bbls mud in hole add lost circulation material																					
3-27	7232		10.1	45		605	110	15	13	3/5	10.5	6.1		.6	1.0	.8	500	40	13		
Drilling ahead Trip for bit																					
3-28	7568		10.2	45		571	106	12	14	3/6	10.5	5.8		1.2	1.6	1.1	550	40	12		.5
Drilling ahead																					
3-29	7537		10.2	65		171	105	22	21	4/8	10.5	5.9		1.2	1.4	1.2	550	40	11		.25
Drilling ahead lost 120 bbls on surface																					
3-30	7590		10.2	65		641	106	15	11	3/4	10.5	5.5		1.9	1.4	.6	600	40	11		.75
Coring																					

Date	Bar	Gel	Benex	Caustic	Spersene	Soda Ash	Magcophos	Fybre	Bicarbonate	CMC	XP-20	Mica	Nut Plug	Driscose			Engr. Service	Mud Cost
3-7		118	24	7		6											10	
3-8		82	4			3	6										1	
3-9		75	11	1		6											1	
3-10	20	50					2	1									1	
3-11	10	40	7	1		3											1	
3-12							1										1	
3-13		4		1		1											1	
3-14																	1	
3-15																	1	
3-16		112	12	6		9	6		1								1	
3-17		53				3	4		6								1	
3-18	10	13		3	20												1	
3-19	20	35	1	11	88												1	
3-20	15	63															1	
3-21	15	59	31	6	20					1							1	
3-22	15	7		9	20					6							1	
3-23		23		6													1	
3-24	20	93		2	20						10						1	
3-25	15	155		12						6							1	
3-26	20	125		13	12			6				25	30				1	
3-27				11	15							2	2				1	
3-28	20	60		22	21					6		3	3	1			1	
3-29	10	25		2										1			1	
3-30	20	12		6	34					4							1	

WELL HISTORY

Magcobar

DRILLING FLUID SERVICES

DRILLING MUD RECORD

PAGE ___ OF ___

OPERATOR: Husky Oil	SECTION:	TOWNSHIP:	RANGE:
WELL: W.T. Foran #1	FIELD: Pet 4	MUD TYPE: Benex (spud) Lignosulfonate	
CONTRACTOR: Nabors	COUNTY/PARISH: North Slope	SPUD DATE: 3-6-77	
ENGINEERS: Faulkner/Stevens/Shields/Drillinger	STATE: Alaska	T.D. DATE: 4-8-77	DAYS TO T.D.: 34

CASING	SIZE	DEPTH	BIT SIZE
CONDUCTOR			
SURFACE	16	1454	
INTERMEDIATE	10-3/4	7587	
LINER(S)			
PRODUCTION			

BITS	PUMPING HOURS	DEGASSER	DESANDER	DESILTER	CENTRIFUGE	SHAKER SCREENS

DATE	MEAS. URED DEPTH	TVD	MUD WT	VIS SEC	ANGLE AND DIRECTION	FLOW RATE (gpm)	FLOW LINE TEMP	PV	YP	GELS 0/10	PH	API FLUID LOSS	HTHP FLUID LOSS	Pf	Mf	Pm	SALT OR CHLORIDE	CALCIUM (ppm)	SOL %	OIL %	SAND
3-31	7590		10.2	45		441	106	15	13	3/4	10.5	5.5		.8	1.4	.6	500	40	11		.75
E-Logging																					
4-1	7591		10.2	43		441	95	13	11	3/4	10.5	5.7		1.0	1.4	.7	550	40	0		.25
Run 10-3/4" casing																					
4-2	7591		10.3	45		444	95	17	11	3/5	10	4.4		.3	2.8	.3	500	160	10		.75
Cement 10-3/4" casing and circulate																					
4-3	7591		10.3	45				17	11	3/5	10	4.5		.4	2.7	.4	500	180	10		.5
Nippling up																					
4-4	7593		10.1	55		444		21	14	4/15	11.5	6.4		1.2	2.5	1.2	400	40			
Dumped contaminated mud built new volume																					
4-5	7676		10	45		373	110	16	11	5/15	11.5	5.2		1	2.3	1	400	60	11		1
Drilling circulate and POOH for bit																					
4-6	7676		9.8	40			90	13	8	3/5	11	5.2		.8	2	.8	500	200	10		
Run DST Test																					
4-7	7990		9.8	45		433	100	15	11	3/5	11	4.8		.5	1.8	.5	600	160	10		
Drilling ahead																					
4-8	8217		10.1	40		433	100	15	10	4/6	10.5	5.4		.5	1.7	.5	600	120	10		
Drilling ahead																					
4-9	8253		10	40		448		17	14	3/5	10	5.6		.5	1.5	.5	600	100	0		
Drilling Trip for bit																					
4-10	8264		10	41		306	82	12	11	2/4	11	6		1.1	1.9	1.3	400	60	8		
Coring																					
4-11	8283		10.1	50		437	101	22	20	6/10	11	5.2		.8	1.9	1.2	500	60	10		
DST																					
4-12	8318		10.1	45		329	90	21	13	3/6	10.5	5.2		.3	1.5	1	600	40	10		
Drilling ahead																					
4-13	8561		10.1	42		303	107	15	11	2/5	10.5	5.5		.3	1.6	.8	600	40	10		
Drilling ahead																					
4-14	8702		10.1	42		303	114	16	13	4/7	9.5	5.1		.15	1.6	.6	500	40	12		
Drilling ahead																					
4-15	8815		10.2	41		303	110	14	10	2/4	11	5.4		.7	1.9	1.2	600	40	9		
Drilling ahead																					
4-16	TD		10.2	43						/											
Logging																					
4-17	TD		10.1	44			98	15	12	2/3	10.5	5.2		.3	2.1		500	40	9.5		
Logging																					
4-18	TD									/											
Circulating ready for plug																					
4-19	TD		10.1	43				18	14	2/6	10.5	6.2		.5	2.8		600	120	11		.5
Lost 200 bbls mud ran bond log																					
4-20	TD		10.1	42						/											
DST Inventory adjustment																					
4-21	TD									/											
Come out lay down pipe																					
4-22	TD									/											
Cut casing and plug stub with cement																					

DATE	BAR	GEL	BENEX	CAUSTIC	SPERSENE	SODA ASH	MAGCOPHOS	FYBRE	BICARBONATE	CMC	XP-20	MICA	NUT PLUG	DIRSCOSE			ENGR. SERVICE	MUD COST
3-31	20	3			14					2							1	
4-1	20				14												1	
4-2												5			4			
4-3																	1	
4-4	420	127		8	10				6	6							1	
4-5	20	27			6												1	
4-6	20																1	
4-7	110	21		2	12					6							1	
4-8	275	55		2	13												1	
4-9																	1	
4-10	140	6		10													1	
4-11	230	53		2	20					6							1	
4-12	20																1	
4-13		13		2	15												1	
4-14				2	15					6							1	
4-15	120	60		14	8							2	2				1	
4-16	30	15		4	15					1							1	
4-17	30																1	
4-18																	1	
4-19	95	20			20				2								1	
4-20	30																1	
4-21	30																1	
4-22	30																1	

BIT RECORD

HUSKY OIL NPR OPERATIONS, INC.
W. T. Foran No. 1, Section 13, T17N, R2W, Umiat Meridian, North Slope, Alaska

BIT NO.	BIT SIZE	BIT MFGR.	BIT TYPE	SER. NO. OF BIT	JET SIZE 1	2	3	DEPTH OUT	FTGE.	HRS. RUN	ACC. HRS.	FT. PER. HR.	WEIGHT 1000 LBS	ROTARY R.P.M.	VERT. DEV.	PUMP PRESS	PUMPS LINER	SPM.	MUD WT.	VIS	DULL CODE T	B	G
1	18½	HTC	OSC3AJ	DB860	16	16	16	991	929	20 1/2	20 1/2	45.3		120		300		90	10.4	45	1	8	I
2	18½	HTC	OSC3AJ	B41622	16	16	16	2440	1449	24 1/2	24 1/2	59.1	25/ 35	100		800		100	9.8	60	6	6	I
3	13½	HTC	OSC3AJ	ZW864	13	13	13	3544	1104	22 3/4	47 1/4	48.5	15/ 20	75/ 100	7 3/8°	1000/ 1500		100/ 120	9.9	63	5	3	I
4	13½	HTC	OSC3AJ	ZZ679	13	13	13	3448	403	14 1/2	61 3/4	27.8	20/ 22	110	7 3/4°	1500		120	9.9	58	3	2	I
5	13½	HTC	OSC3AJ	ZZ680	13	13	13	4674	526	32	93 3/4	16.4	30/ 40	80/ 100	2 1/2°	2800		77	9.8	43	2	3	I
6	13½	HTC	OSC3AJ	ZZ586	13	14	14	5314	640	32 1/2	126 1/4	19.7	40	70	1°	2100		28	10	44	2	3	I
7	13½	HTC	OSC3AJ	ZZ585	13	14	14	5883	569	29 3/4	156	19.1	55	120	1°	2400		95	9.9	40	4	2	I
8	13½	HTC	OSC3AJ	ZW862	13	13	13	6634	751	28 1/2	184 1/2	26.4	55	120	4°	2400		95	10	41	4	7	I
9	13½	HTC	OSC3AJ	ZZ684	13	13	13	7227	593	31 1/2	216	18.8	45	90		2400		90	10.1	43	3	6	I
10	13½	HTC	OSC3AJ	ZW864	13	13	13	7537	304	18 1/4	234 1/4	16.7	45	90		1800		100	10.2	45	3	7	I
11	13½	HTC	OSC3AJ	ZZ625	13	13	13	7591	54	3 3/4	238	14.4	45	90	7°						2	2	I
12	8½	HTC	XJG	PH412	12	12	12	7601	10	4	242	2.5	70/ 90	15/ 40		2000/ 1000		120	10.1	55	2	2	I
13	8½	STC	F-2	ZC568	12	12	12	7626	75	4 1/2	246 1/2	16.7	35	50		2000		118	10	45	1	1	I
RR	8½	STC	F-2	ZC568	12	12	12	8253	577	27 1/2	274	21	35	50	3°	1900		117	10.1	40	5	5	I
14	8½	HTC	J-7	HS-255	12	12	12	8283					CLEAN OUT BIT - NO DRILLING										
15	8½	STC	F-3	AT383	9	9	9	8779	496	57 1/2	331 1/2	8.6	30	52	7 3/4°	2400		81	10.2	41	6	4	I
16	8½	STC	F-3	AT476	9	9	9	8864	85	16	347 1/2	5.3	30	52	8°	2400		81	10.2	43	2	1	I

CASING INTRODUCTION

Casing programmed for W. T. Foran No. 1 was as follows: 20" at 80'; 16" at 2500'; 10-3/4" at 7000'; and a 7" liner run to a total depth of 8820' if needed for evaluation. Actual casing run was 20" at 102', 16" at 1454', and 10-3/4" at 7587'. The 16" was stuck at 1454' while attempting to run it to a drilled depth of 2440'. It could not be worked loose and was cemented in place. The 7" liner was not needed for evaluation.

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No. 4 Well W. T. Foran No. 1 Date March 2, 1977

Size Casing 20" Conductor Setting Depth 102' Top (liner hanger) _____

Hole Size 26 " Mud Gradient _____ Viscosity _____

Casing Equipment

_____ shoe, _____ float located _____ feet

above shoe. _____ (DV, FO) collars located at _____ feet

and _____ feet

_____ centralizers located _____

_____

_____ scratchers located _____

_____

Liner hanger and pack off (describe) _____

_____

Miscellaneous (baskets, etc.) _____

_____

Cement (around shoe)

	No Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	312	Dowell	Arctic Set II		15.2	290
(2)	300	Dowell	Arctic Set II	1" Top Job		

Cement through (DV, FO) Collar at _____ feet

	No Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

CASING TALLY
SUMMARY SHEET

DATE: March 12, 1977

FIELD Naval Petroleum Reserve No. 4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 16 " CASING

SUMMARY OF PAGE MEASUREMENTS			
	NO. OF JOINTS	FEET	00'S
PAGE 1	36	1461	44
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	36	1461	44

SUMMARY OF DEPTH CALCULATIONS				
		NO. OF JOINTS	FOOTAGE FEET	00'S
1	TOTAL CASING ON RACKS	67	2708	68
2	LESS CASING OUT JTS NOS	31	1247	24
3	TOTAL (1 - 2)	36	1461	44
4	SHOE LENGTH		1	85
5	FLOAT LENGTH		1	85
6	MISCELLANEOUS EQUIPMENT LENGTH			
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		1465	14
8	LESS WELL DEPTH (KB REFERENCE)		1454	26
9	"UP" ON LANDING JOINT		10	88

Weight indicator before cementing: 123,000 ; after slack-off: 100,000 ; inches slacked off 2 .

SUMMARY OF STRING AS RUN								
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW-USED	LOCATION IN STRING	NO. OF JOINTS	FOOTAGE	INTERVAL
84	K-55	8rd		New	JT NO Shoe THRU NO 1	1	1.85	1454.26 ' - 1452.41 '
					JT NO 1 THRU NO 2	3	81.52	1452.41 ' - 1370.89 '
					JT NO 1 THRU NO 3	1	1.85	1320.89 ' - 1369.04 '
					JT NO 2 THRU NO 36	34	1369.04	1369.04 ' - KB '
					JT NO Cut Off THRU NO		10.88	KB ' - 10.88 ' Above KB
					JT NO THRU NO			
					JT NO THRU NO			

PAGE 1 OF 1

CASING TALLY

DATE: March 12, 1977

FIELD NPR-4 LEASE & WELL NO. W.T. Foran No. 1 TALLY FOR 16 " CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	40	34			
2	41	18			
3	41	53			
4	39	50			
5	41	51			
6	40	58			
7	41	02			
8	40	91			
9	40	33			
0	41	40			
TOTAL A	408	30			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	40	39			
2	40	58			
3	39	92			
4	39	85			
5	42	54			
6	41	65			
7					
8					
9					
0					
TOTAL D	244	93			

1	41	17			
2	41	85			
3	39	61			
4	40	42			
5	40	55			
6	40	75			
7	41	21			
8	40	82			
9	39	66			
0	40	93			
TOTAL B	406	97			

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1	40	15			
2	40	40			
3	37	92			
4	40	61			
5	41	13			
6	38	50			
7	41	80			
8	39	75			
9	40	58			
0	40	40			
TOTAL C	401	24			

TOTAL A	408	30		
TOTAL B	406	97		
TOTAL C	401	24		
TOTAL D	244	93		
TOTAL E				
TOTAL PAGE	1461	44		

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No. 4 Well W. T. Foran No. 1 Date March 12, 1977

Size Casing 16 Setting Depth 1454' KB Top (liner hanger) _____

Hole Size 18 1/2" Mud Gradient .52 psi/ft (10.0 ppg) Viscosity 74

Casing Equipment

Dowell Cement Guide shoe, Dowell Duplex float located 81 feet

above shoe, _____ (DV, FO) collars located at _____ feet

and _____ feet

Dowell Latch-on centralizers located 1444', 1413', 1371', and 1332'

_____

_____ scratchers located _____

_____

Liner hanger and pack off (describe) _____

_____

Miscellaneous (baskets, etc.) _____

_____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	1605	Dowell	Arctic Set II		15.2	1685 ft
(2)						

Cement through (DV, FO) Collar at feet

	No Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated 53 bbls @ 3.8 BPM, pumped in 300 ~~(sks, lbs)~~, (barrels) cement and 5 bbls prewash, used bottom plug (~~was~~, not), mixed cement (1) above ____ minutes, cement (2) above ____ minutes, top plug (yes, not) displaced with 5 water/19 mud (~~sks, lbs~~), (barrels) in 6 minutes at rate of 3.8 BPM, CFM, (Bumped plug) (Did not bump plug) Final Pressure 600 Reciprocated pipe (pipe stuck) feet while (mixing) and (displacing) cement. Displacing time (continual mixing) minutes Had 14.7# cement at surface circulation (full, partial, none, etc.). Completed job at 3:45 ~~a.m.~~, p.m.

Cementing Procedure (through (DV, FO) at ____ feet) (cross out where necessary)

Opened (DV, FO) at ____ a.m., p.m., circulated ____ bbls @ ____ BPM, pumped in ____ (cu. ft.), (barrels) ____ prewash, mixed cement (3) above ____ minutes, cement (4) above ____ minutes, dropped closing plug, displaced with ____ (cu. ft.), (barrels) in ____ minutes at rate of ____ BPM, CFM. (Bumped plug) (Did not bump plug). Final Pressure ____ Displacing time ____ minutes. Had ____ circulation (full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

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Foreman

CASING TALLY
SUMMARY SHEET

DATE: April 1-2, 1977

FIELD Naval Petroleum Reserve No. 4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 10 3/4" CASING

SUMMARY OF PAGE MEASUREMENTS			
	NO OF JOINTS	FEET	00'S
PAGE 1	50	2152	63
PAGE 2	50	2134	71
PAGE 3	50	2120	22
PAGE 4	37	1595	06
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	187	8002	62

SUMMARY OF DEPTH CALCULATIONS				
		NO OF JOINTS	FOOTAGE FEET	00 S
1	TOTAL CASING ON RACKS	187	8002	62
2	LESS CASING OUT (JTS NOS	9	389	27
3	TOTAL (1 - 2)	178	7613	35
4	SHOE LENGTH	1	1	85
5	FLOAT LENGTH	1	1	55
6	MISCELLANEOUS EQUIPMENT LENGTH FOs	2	7	60
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)	182	7624	35
8	LESS WELL DEPTH (KB REFERENCE)		7587	31
9	"UP" ON LANDING JOINT		37	04

Weight indicator before cementing 420,000 ; after slack-off 195,000 ; inches slacked off 3

SUMMARY OF STRING AS RUN									
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL	
60.7	P-110	8rd		New	JT NO Shoe THRU NO 1	1	1.85	7587.31	7585.46
					JT NO 1 THRU NO 2	2	86.75	7585.46	7498.68
					JT NO 2 THRU NO 3	1	1.55	7498.68	7497.13
					JT NO 3 THRU NO 148	145	6193.20	7497.13	1303.43
					JT NO FO THRU NO 149	1	3.80	1303.43	1300.13
					JT NO 149 THRU NO 150	1	43.82	1300.13	1256.31
					JT NO FO THRU NO 151	1	3.80	1256.31	1252.51
					151 182	30	1289.40	1252.51 - 37.04 Above KB	

PAGE 1 OF 4

CASING TALLY

DATE: April 1, 1977

FIELD NPR-4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 10 3/4" CASING

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	42	78			
2	44	00			
3	44	18			
4	44	35			
5	43	02			
6	42	33			
7	43	87			
8	44	88			
9	41	18			
0	41	18			
TOTAL A	431	77			

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	43	65			
2	43	89			
3	43	96			
4	44	80			
5	43	48			
6	43	60			
7	44	74			
8	41	62			
9	43	89			
0	43	75			
TOTAL D	437	38			

1	41	32			
2	39	83			
3	39	80			
4	40	95			
5	43	66			
6	42	26			
7	42	48			
8	44	53			
9	39	74			
0	43	85			
TOTAL B	418	42			

1	40	86			
2	44	22			
3	43	59			
4	41	61			
5	45	02			
6	44	83			
7	43	67			
8	42	54			
9	38	95			
0	39	02			
TOTAL E	424	31			

1	42	88			
2	44	00			
3	44	55			
4	43	56			
5	44	09			
6	44	88			
7	44	71			
8	44	50			
9	43	11			
0	44	47			
TOTAL C	440	75			

TOTAL A	431	77		
TOTAL B	418	42		
TOTAL C	440	75		
TOTAL D	437	38		
TOTAL E	424	31		
TOTAL PAGE	2152	63		

47

PAGE 2 OF 4 CASING TALLY DATE: April 1, 1977

FIELD NPR-4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 10 3/4 " CASING

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	40	43			
2	43	71			
3	42	30			
4	39	49			
5	43	58			
6	43	98			
7	45	32			
8	44	12			
9	38	52			
0	39	32			
TOTAL A	420	77			

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	44	58			
2	45	12			
3	44	33			
4	44	31			
5	42	53			
6	40	45			
7	44	56			
8	40	68			
9	39	91			
0	44	35			
TOTAL D	430	82			

1	44	05			
2	45	45			
3	43	88			
4	44	61			
5	40	56			
6	44	29			
7	43	73			
8	44	51			
9	39	26			
0	42	98			
TOTAL B	433	32			

1	44	63			
2	44	51			
3	44	50			
4	39	55			
5	40	29			
6	41	34			
7	44	28			
8	40	75			
9	40	62			
0	39	81			
TOTAL E	420	28			

1	41	89			
2	45	32			
3	44	90			
4	41	62			
5	39	63			
6	42	46			
7	40	54			
8	42	93			
9	44	78			
0	45	45			
TOTAL C	429	52			

TOTAL A	420	77			
TOTAL B	433	32			
TOTAL C	429	52			
TOTAL D	430	82			
TOTAL E	420	28			
TOTAL PAGE	2134	71			

PAGE 3 OF 4

CASING TALLY

DATE: April 1, 1977

FIELD NPR-4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 10 3/4" CASING

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	40	84			
2	45	10			
3	44	01			
4	42	20			
5	41	22			
6	41	62			
7	41	28			
8	44	70			
9	39	99			
0	38	95			
TOTAL A	419	91			

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	43	82			
2	44	91			
3	39	65			
4	43	79			
5	42	37			
6	43	80			
7	44	32			
8	40	39			
9	43	86			
0	44	11			
TOTAL D	431	02			

1	43	47			
2	40	11			
3	39	46			
4	45	08			
5	44	90			
6	40	99			
7	43	42			
8	39	51			
9	40	79			
0	45	30			
TOTAL B	423	03			

1	43	76			
2	44	39			
3	39	93			
4	43	53			
5	40	86			
6	44	49			
7	40	52			
8	43	82			
9	41	17			
0	42	59			
TOTAL E	425	06			

1	44	30			
2	38	99			
3	44	22			
4	42	38			
5	40	30			
6	44	31			
7	43	78			
8	34	56			
9	44	60			
0	43	76			
TOTAL C	421	20			

TOTAL A	419	91		
TOTAL B	423	03		
TOTAL C	421	20		
TOTAL D	431	02		
TOTAL E	425	06		
TOTAL PAGE	2120	22		

PAGE 4 OF 4

CASING TALLY

DATE: April 1, 1977

FIELD NPR-4 LEASE & WELL NO. W. T. Foran No. 1 TALLY FOR 10 3/4 " CASING

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	43	64			
2	43	80			
3	43	09			
4	41	14			
5	40	37			
6	44	44			
7	44	13			
8	41	31			
9	40	70			
0	45	25			
TOTAL A	427	87			

JOINT NO	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	39	38			
2	42	02			
3	42	46			
4	43	83			
5	44	35			
6	44	38			
7	43	18			
8					
9					
0					
TOTAL D	299	60			

1	42	08			
2	43	58			
3	44	82			
4	42	68			
5	40	80			
6	43	38			
7	44	05			
8	44	71			
9	44	07			
0	45	08			
TOTAL B	435	25			

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1	40	50			
2	42	68			
3	42	50			
4	43	70			
5	40	88			
6	43	69			
7	44	94			
8	43	78			
9	44	97			
0	44	70			
TOTAL C	432	34			

TOTAL A	427	87		
TOTAL B	435	25		
TOTAL C	432	34		
TOTAL D	299	60		
TOTAL E				
TOTAL PAGE	1595	06		

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No. 4 Well W. T. Foran No. 1 Date April 2, 1977

Size Casing 10 3/4" Setting Depth 7587' Top (liner hanger)

Hole Size 13 1/2" Mud Gradient .53 psi/ft (10.2 ppg) Viscosity 45

Casing Equipment

Dowell Cement Guide shoe, Dowell float located 86.75 feet

above shoe two Howco ~~(DV,~~ FO) collars located at 1339 feet

and 1295 feet

Dowell centralizers located 7544', 7500', 7456', 7412', 7327',

7238', 7074', 6908', 1340', 1213', 999', 787', 571', 355', and 140',

scratchers located

Liner hanger and pack off (describe)

Miscellaneous (baskets, etc.)

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	1000	Dowell	"G"	0.75% D65; 0.2% D13R	15.8	1151 ft^3
(2)						

Cement through (DV, FO) Collar at feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated 720 bbls @ 8 BPM, pumped in 205 ~~(cu. ft.)~~ (barrels) cement and 50 bbls prewash, used bottom plug (yes, ~~no~~), mixed cement (1) above 2 hours and 20 minutes, cement (2) above _____ minutes, top plug (yes, ~~no~~) displaced with 682 ~~(cu. ft.)~~ (barrels) in 70 minutes at rate of 8 BPM, CFM, (~~Bumped plug~~) (Did not bump plug). Final Pressure 375 psi. Reciprocated pipe 0 feet while (mixing) and (displacing) cement. Displacing time 70 minutes. Had partial (lost 75 bbls mud) circulation (full, partial, none, etc.). Completed job at 4:45 a.m., ~~p.m.~~.

Cementing Procedure (through (DV, FO) at _____ feet) (cross out where necessary)

Opened (DV, FO) at _____ a.m., p.m., circulated _____ bbls @ _____ BPM, pumped in _____ (cu. ft.), (barrels) _____ prewash, mixed cement (3) above _____ minutes, cement (4) above _____ minutes, dropped closing plug, displaced with _____ (cu. ft.), (barrels) in _____ minutes at rate of _____ BPM, CFM. (Bumped plug) (Did not bump plug) Final Pressure _____ Displacing time _____ minutes. Had _____ circulation (full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

_____

_____

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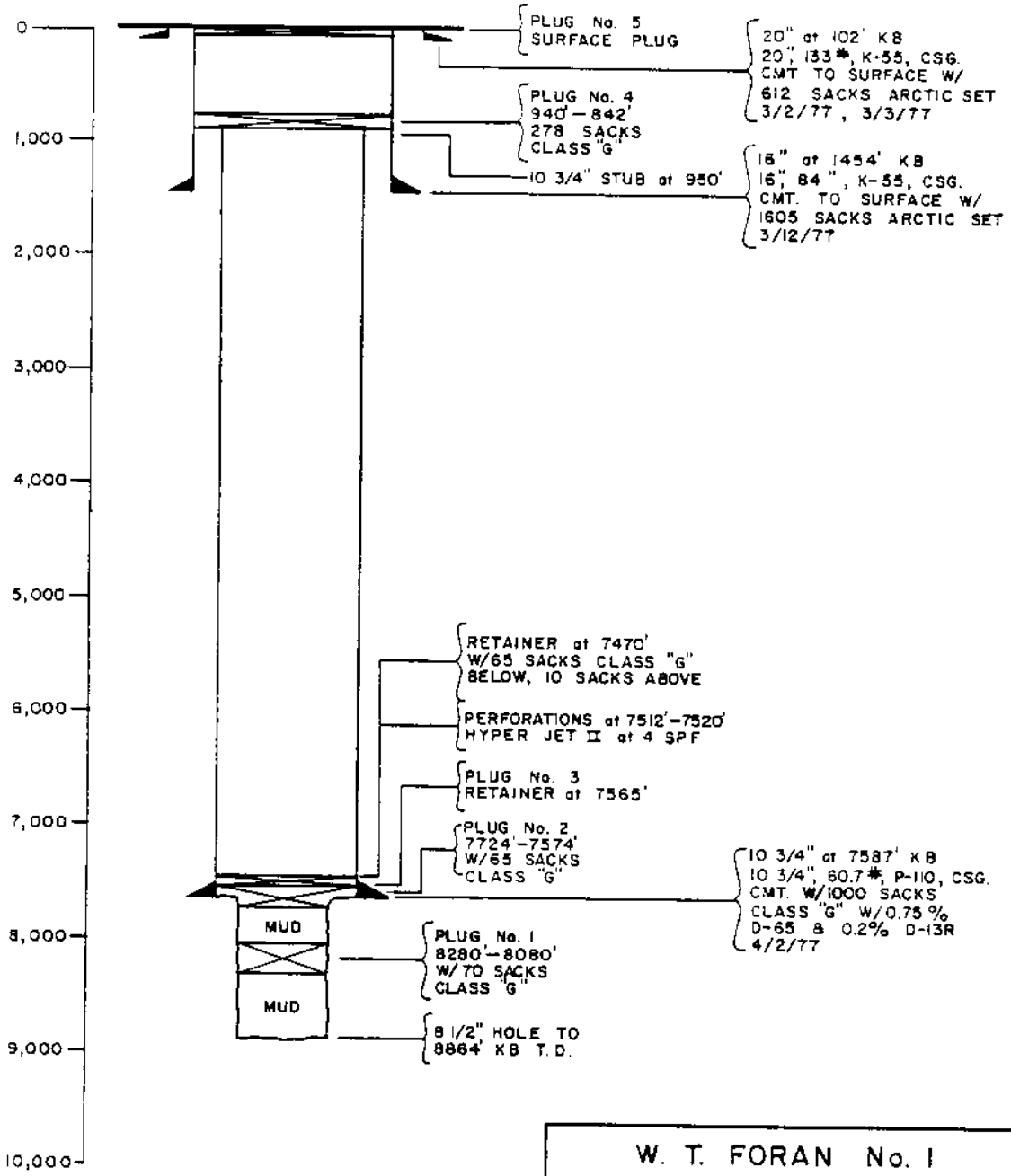
_____
Foreman



W. T. FORAN No. 1

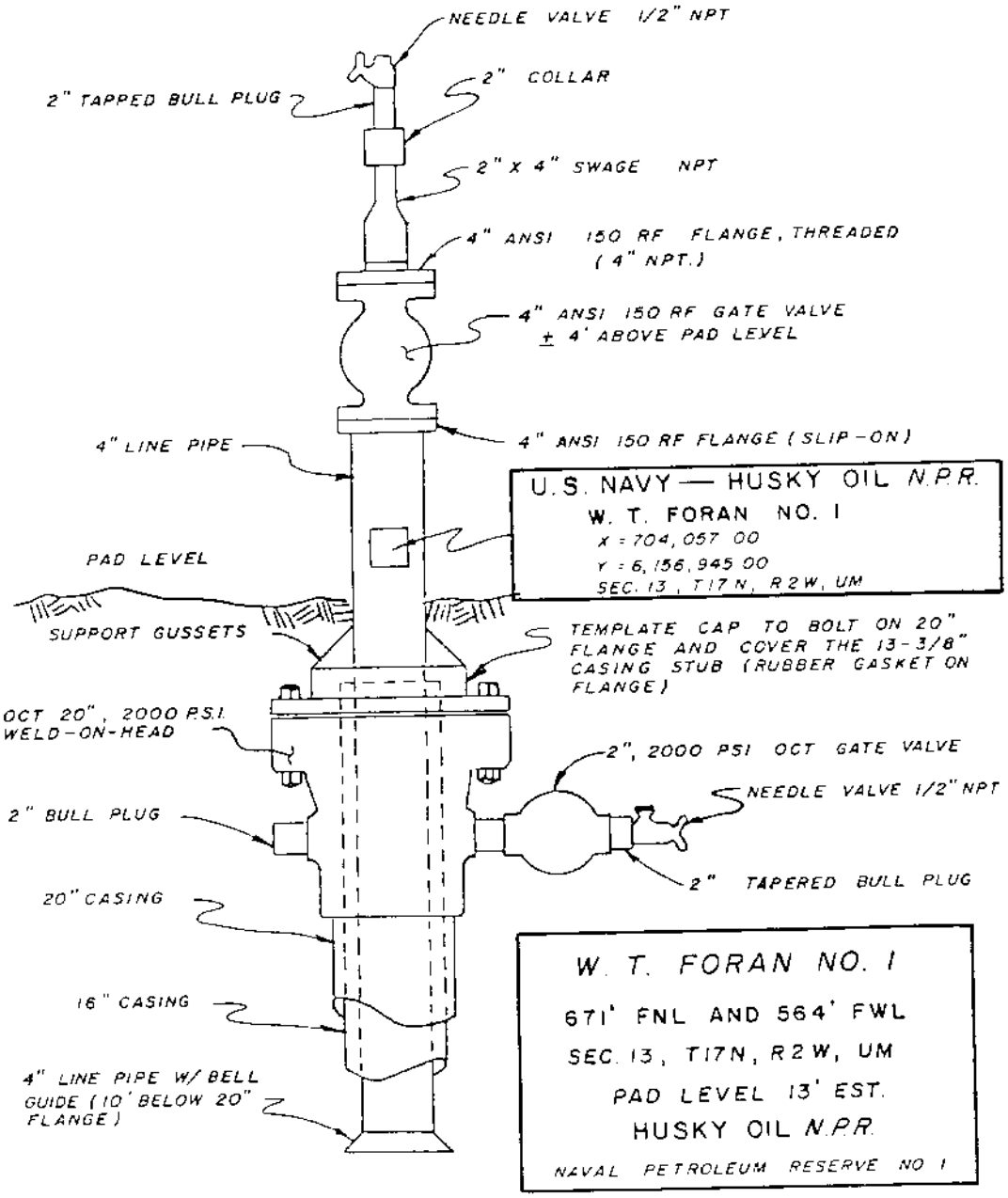
671' FNL and 564' FWL
Sec. 13, T.17N., R.2W., U.M.
PAD LEVEL 13' Est.
KB 35' Est.

HUSKY OIL *N.P.R.*

NAVAL PETROLEUM RESERVE No. 4

WELLBORE SCHEMATIC

ABANDONMENT HEAD



RIG INVENTORY

Draw Works

National 110, Serial No. T1866 grooved for 1-3/8" line. Equipment with Fluid Brake Company, Model S501A auxiliary brake, Serial No. 114-50, Crown-O-Matic Model TCB crown stopper, and National Micro-Matic automatic driller.

Rig Drive

National BT3, 3 section drive with 2 pump drives.

Engines

Three Caterpillars, D398, with National C300 Torque Convertors. Engines equipped with heat exchangers and waste heat recovery system in substructure. Horsepower rating without fans approximately 800 HP each.

Pumps

No. 1 - Emsco F1000 Tri-plex driven by compound.

No. 1 - National G1000, Serial No. 8298 with H1250 fluid end.

Substructure

Lee C. Moore Corporation:

Overall length	56.10'
Overall width	23.00'
Floor Height	20.30'
Motor Height	16.30'

Mast

Lee C. Moore Corporation Serial No. T3013.
1,025,000 lb. GNC.

Blocks

National Model 548-F300 block hook assembly grooved for 1-3/8" line, 300 ton capacity.

Swivel

National Type R - Serial No. T2985 with R. B. Type washpipe and packing

Rotary Table

Ideco, Model HS-275, 27-1/2", Serial No. 101.

57

Tongs

B. J. Type B
Kelly Bushings - Varco H. D. square drive.

Accumulator

Koomey, Model T, 20160-3S Serial No. 4899, 3,000 lb. w.p. with 16 10-gallon Greer hydraulic bottles.

Blowout Preventers

1 - 13-5/8" 5,000 lb. Hydril Model GK, Serial No. 5103.

1 - 13-5/8" 5,000 lb. double Shaffer, Serial No. 2145.

1 - 13-5/8" 5,000 lb. single Shaffer, Serial No. 486-LA 80.

1 - 20" 2,000 lb. Hydril.

Boilers

2 - Williams and Davis 150 HP oil-fired boilers.

Mud Tanks

No. 1 30' x 8' x 5' 8" deep with 4 low-pressure guns - 2 high-pressure guns and Rumba Dual Shale shakers.

No. 2 30' x 8' x 5' 8" deep with 2 low-pressure guns, 2 high-pressure guns, 1 - 5 HP lightening mixer.

No. 3 40' x 8' x 5' 8" deep with 2 low-pressure guns, 3 high-pressure guns, 5 HP lightening mixer.

No. 4 30' x 9' x 5' 8" deep pre-mix tank with 2 mud hoppers and 5" x 6" mixing pump.

Degasser

Clark Gas Hog, Serial No. 17.

Desander

Demco Model 123 with 3 - 12" cones.

Desilter

Sweco Model 6T4 156 with 12 - 4" cones.

Light Plants

Two Caterpillar D379B, 400 KW generator sets and necessary distribution system.

Overshots

1 - 10-5/8" Bowen Model 150, maximum catch 9"

1 - 7-5/8" O.D. Bowen Model 150, maximum catch 6-1/2"

Water-Fuel Tanks

2 - Combination water fuel tanks. Approximate capacity 800 barrels water, 16,000 gallon fuel.

Drill Collars

20 - approximately 7-3/4" O.D. x 2-7/8" I.D. drill collars with 6-5/8" regular connections.

21 - 6-1/4" O.D. x 2-3/4" I.D. drill collars with 4-1/2" x H connections.

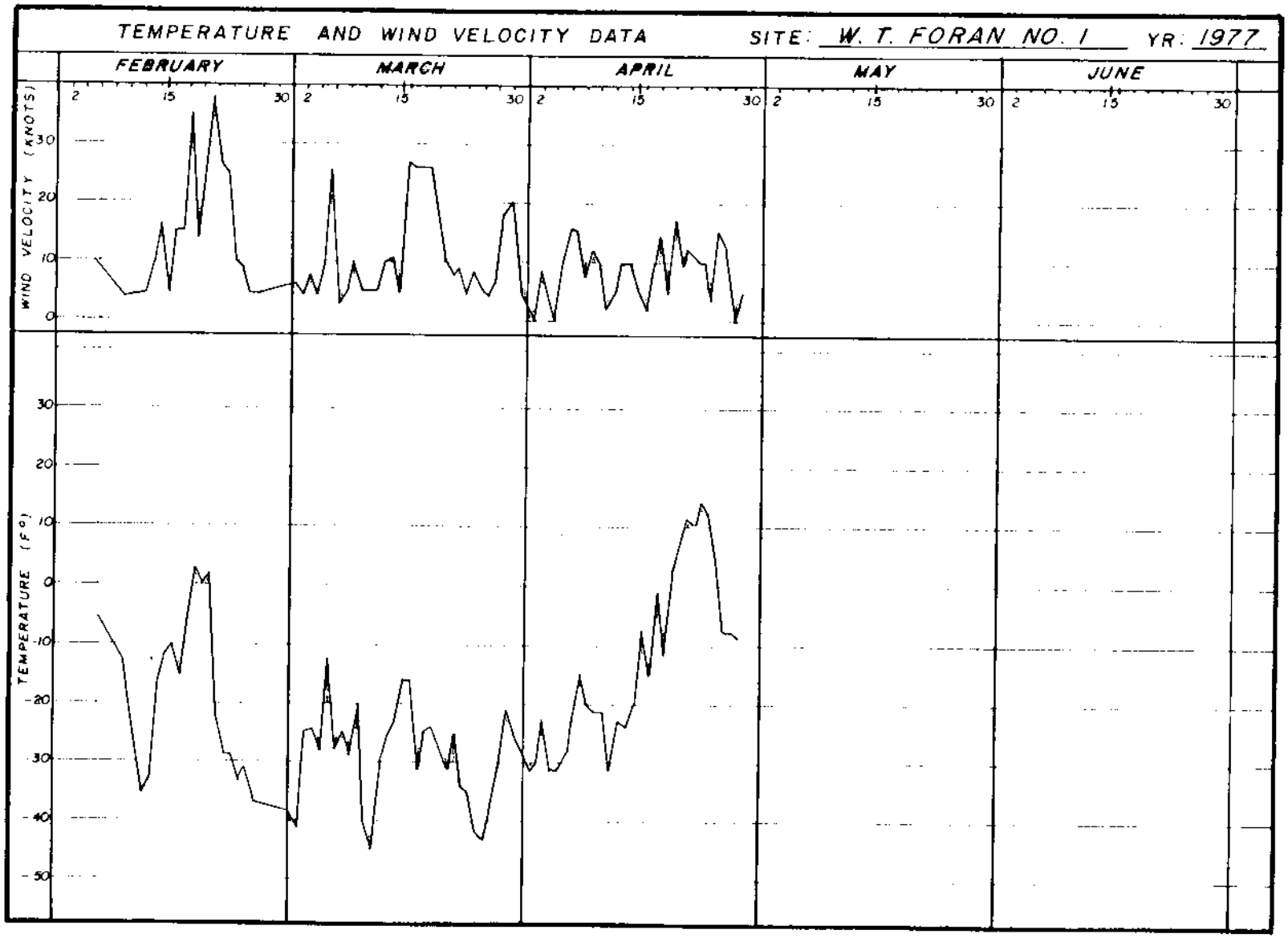
Drill Pipe

100 joints. 5" 19.50 lb. Grade G drill pipe.

5" 19.50 lb. Grade E pipe as needed.

Air Heater

1 - 4,200,000 BTU Air Heater


TEMPERATURE AND WIND VELOCITY DATA
SITE: W. T. FORAN NO. 1
YR: 1977
FEBRUARY
MARCH
APRIL
MAY
JUNE
2
15
30
WIND VELOCITY (KNOTS)
30
20
10
0
TEMPERATURE (F°)
30
20
10
0
-10
-20
-30
-40
-50

SNOW MELTER OPERATION

A snow melter was used during the drilling operation for water supply. Surrounding lakes were shallow and frozen to bottom. The closest source was approximately 12 miles southwest which made the use of the snow melter feasible. The snow-melter unit was oil fired with 6MM BTU output. The unit was equipped with a diesel-powered generator for remote operations. A front-end loader and Cat were used to support the operation. The Cat was used for stockpiling snow and to relocate the snow melter as required. Snow was fed into the melting chamber by means of the front-end loader. The operation was very successful and resulted in considerable savings, as compared to supplying water by means of all-terrain vehicles. The following is pertinent data associated with the snow-melter operation:

Days operated:	57
Total water output:	37,496 barrels
Total fuel consumption:	29,445 gallons
Total hours operated:	737
Average daily output:	658 barrels
Average fuel consumption:	517 gallons/day
Average daily operations:	13 hours/day
Peak daily output:	1,550 barrels.